UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/748,141	12/27/2000	Yoshihisa Abe	44319-056	3302

7590   09/23/2004

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EXAMINER
NGUYEN, KIMBINH T

ART UNIT	PAPER NUMBER
2671	

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>24 August 2004</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-22</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,3-8,14,15 and 17-22</u> is/are rejected.

7)☒ Claim(s) <u>2,9-13 and 16</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee

set forth in 37 CFR 1.17(e), was filed in this application after final rejection.

Since this application is eligible for continued examination under 37 CFR 1.114,

and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the

previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on 08/24/04 has been entered.

2.   Claims 1-22 are pending in the application.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1, 4-8, 15, 17-20 are rejected under 35 U.S.C. 102(b) as being

anticipated by Lobregt (5,559,901).

        Claim 1, Lobregt teaches calculating estimation values for surfaces to be

deformed (the energy function (velocity and acceleration) is evaluated for the

vertex positions; col. 2, lines 17-33) by shrinking edges or surfaces of a polygon

model (col. 5, lines 39-50) by converging two or more vertices of the polygon

model based on distances between the respective surfaces <u>after each</u>

deformation (col. 5, lines 26-37; col. 10, lines 15-54) and all of the original

vertices before the deformation (the vertices from an initial shape; col. 5, lines

10-24 and col. 11, lines 20-29) involved in the surface deformation; comparing

the calculated estimation values with a predetermined permissible value (if during

minimization of the energy function an edge length exceeds a first predetermined

threshold...if during minimization of the energy function an edge length falls

below a second predetermined threshold; col. 13, lines 49-56) or reducing the

number of data when the estimation values are equal to or below the

predetermined permissible value (if during minimization of the energy function an

edge length falls below a second predetermined threshold, the edge and

connected vertices are replaced by a single vertex; col. 13, lines 53-56).

        Claim 4, Lobregt discloses (the first pass) calculating respective

estimation values based on a predetermined estimation method (a first and

second predetermined threshold; col. 13, lines 49-56) for a plurality of portions of

a polygon model (three shapes 21', 22' and 23'; fig. 5) that are to be deformed by

converging two or more vertices of the polygon model (col. 11, lines 31-38); and

(the second pass) reducing the number of data for the polygon model by

converging two or more vertices of one portion of the polygon model based on

the calculated estimation values after another portion, repeatedly, wherein before

each data reduction, the portion that the estimation value thereof is necessary to

be recalculated for the predetermined estimation method (necessarily the latter

vertex is to be relabeled) as a result of the previous data reductions (in case

several contours to be defined in more or less similar images, operator

intervention can be reduced by using the resulting contour of an image as the start contour for a next image; col. 12, lines 46-52) is defined as a reduction prohibition area (the seed contour is open; the relation between these parameters is constrained by not admitting an oscillatory behavior), and a succeeding data reduction is applied to a portion other than the reduction prohibition area (resampling action and inserted again in the next; col. 11, lines 38-51).

Claim 5, Lobregt teaches the reduction prohibition area (an open contour) is released (vertices are repeatedly removed) if a predetermined condition is satisfied (satisfactory results; col. 11, lines 9-19; lines 37-51).

Claims 6 and 7, Lobregt discloses the predetermined condition is a state that there is no portion to be deformed by converging vertices (an edge segment is divided into two shorter ones of equal length... to be relabeled; col. 11, lines 37-49); the predetermined condition is a state that a predetermined number of data reduction are completed (satisfactory results; col. 11, lines 42-51).

Claim 8 recited as an apparatus for reducing 3D data, claim 8 is rejected with the rationale of the rejection of method claim 1.

Claim 15, the rationale provided in the rejection of claims 1 and 4 are incorporated herein.

Claims 17-19, the rationale provided in the rejection of claims 5-7 are incorporated herein.

Claim 20, Lobregt teaches a minimum estimation value calculator which calculates a minimum estimation value (the energy function reaches a minimum;

col. 1, lines 9-18; col. 4, lines 7-16), a comparator for comparing the minimum

estimation value with a permissible value (col. 11, lines 31-36); determining a

portion (contour) having the minimum estimation value as a portion to be

converged when the minimum estimation value is equal or below the permissible

value (col. 13, lines 53-56).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

6.   Claims 3, 14, 21 and 22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lobregt (5,559,901) in view of Garland et al. "Surface

Simplification Using Quadric Error metrics".

Claims 3, 14, 21 and 22, Lobregt does not teach the polygon model

includes a number of triangular polygons; however, Garland teaches the polygon

model includes a number of triangular polygons ("We assume that the model

consists of triangles only...", page 1, paragraph 4; fig. 1); the portion to be

converged is an edge of a triangular polygon ("our simplification algorithm is

bade on iterative contraction of vertex pairs", page 2, column 2, paragraph 3 and

fig. 10); the portion to be converged is a surface of a triangular polygon (fig. 1). It

would have been obvious to one of ordinary skill in the art at the time the

invention was made to incorporate the triangular polygons taught by Garland into

the deformation process of Lobregt for data reduction, because the triangle is the

most common form of polygons, this implies no loss of generality and would

achieve more reliable results (see section 1 Introduction, page 1, paragraph 4).

Allowable Subject Matter

7.   Claims 2, 9-13 and 16 objected to as being dependent upon a rejected

base claim, but would be allowable if rewritten in independent form including all

of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable

subject matter: the prior art does not teach the estimation value is an error ε

defined by the claimed equation.

Response to Arguments

8.   Applicant's arguments with respect to claims 1, 8 and 15 have been

considered but are moot in view of the new ground(s) of rejection.

The rejection of independent claims has been modified in this Office

action.

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Kimbinh T. Nguyen whose telephone number

is (703) 305-9683. The examiner can normally be reached on Monday to

Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on

alternate Friday from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 20, 2004

Kimbinh Nguyen

Patent Examiner AU 2671